The Ins and Outs of Medial Patellar Luxation

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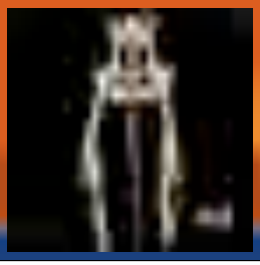
September 23, 2016



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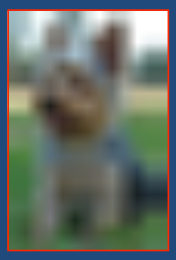
Patellar Luxation

- Very common cause of hind limb lameness
- Developmental or Traumatic
- Medial (80-90%) or Lateral
- Dogs of any size
  - Small breed - MPL
  - Large breed - MPL too!
    - 17-33% LPL



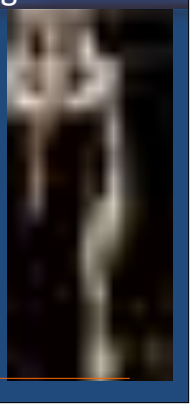
Patellar Luxation

- 50-65% of cases are bilateral
- Breed disposition for Pomeranian, Chihuahua, Miniature Poodle, and Yorkshire Terrier
- History of (progressive) 'skipping' lameness - frequency increases over weeks to months

Limping

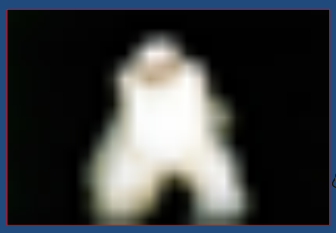
Patellar Luxation Pathogenesis

- Pelvic limb malalignment
- Coxo vara (decreased angle of inclination of femoral neck)
- Quadriceps muscle malalignment
- Internal rotation of the tibia
- Poorly developed femoral trochlear groove



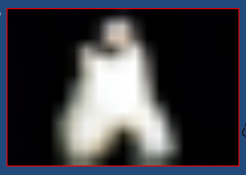
Grade 1

- Patella usually **IN** but can be moved **OUT** with force
- Usually incidental finding; non-clinical



Grade 2

- Patella usually **IN** but moves **OUT** with activity/manually
- Intermittent "skipping" lameness when patella luxates
- May progress to grade 3 luxation with trochlear wear

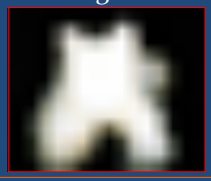


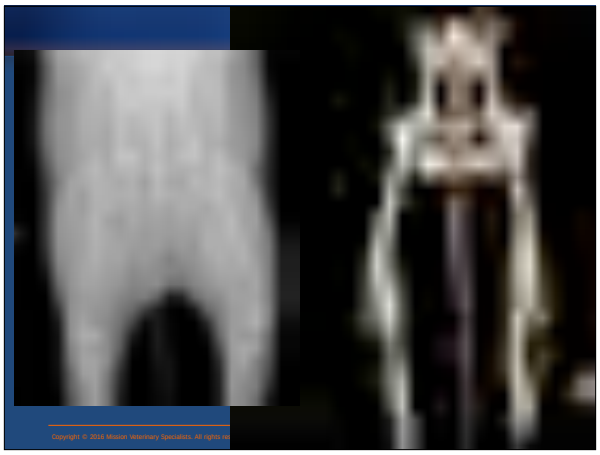
Grade 3

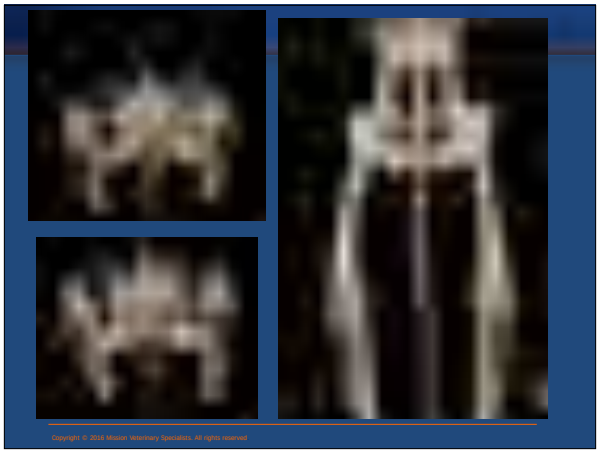
- Patella is usually **OUT** but can be manually reduced **IN**
- Often associated with bony abnormalities
  - Internal rotation of tibia
  - Curve of distal femur
- Bow-legged gait
- Lameness may be non-existent to severe

Grade 4

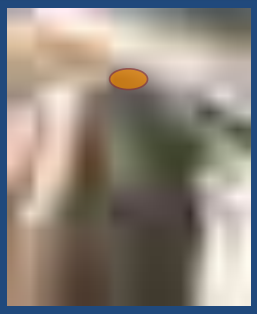
- Patella **OUT** and cannot be manually reduced - stays **OUT**
- Significant bony abnormalities; femoral varus
- Possible crab-like posture and gait
- May become non weight-bearing (CrCL tear?)

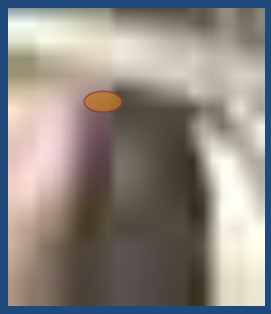






Physical Exam





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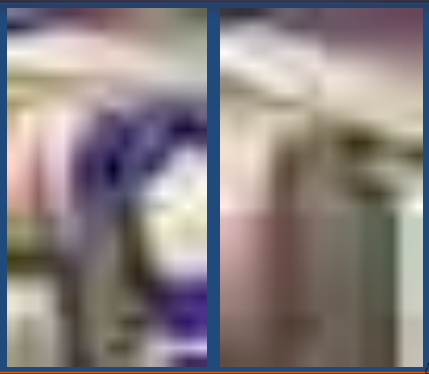
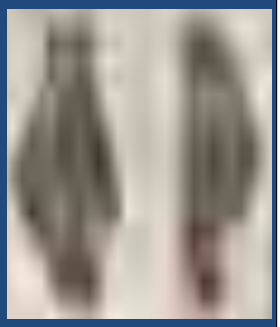


Physical Exam

- Intermittent/Skipping lameness
- Flex and Extend knee ==> In **full extension** push patella medially (and laterally)
- Patella luxates at **extension**
- Feel for femoral trochlea
- Evaluate CrCL (w/patella in)
  - Acute lameness?



When To Do Surgery?

==> Decision based on Grade and Lameness Severity

- **If lame, consider sx; if not, monitor patient**
- All MPL has potential to cause DJD but important to treat lameness and not disease (exception for CrCL tear)
  - Grade 2 MPL could be severely lame while Grade 4 MPL may show no lameness
- If acute lameness in long standing MPL - think CrCL tear

When To Do Surgery?

General Guidelines:

- **Grade 1**: Conservative
- **Grades 2 and 3**
  - Sx if:
    - Lameness occurs more than 3-4x/week
    - If younger —> to protect the CrCL
- **Grade 4:** Often surgical but some small breeds are not lame esp if older

Surgical Goals

1) Retain patella in trochlear groove

2) Align quadriceps mechanism

3) 'Protect' CrCL from additional strain

4) Slow (or stop) progression of OA

Surgical Treatment Options

A) Soft Tissue Procedures
- Imbrication (lateral) and Release (medial)

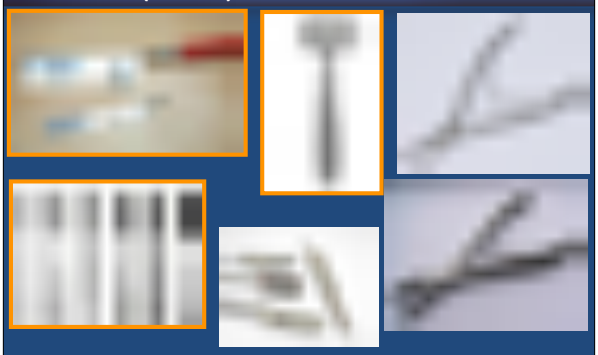
B) Trochleoplasty
- Wedge and Block

C) Tibial tuberosity transposition (TTT)

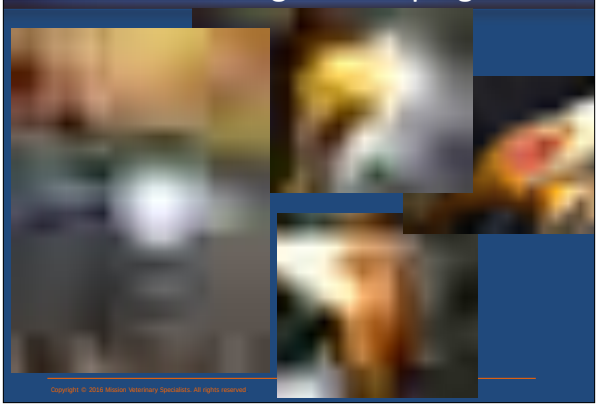
D) Anti-rotational suture in parapatellar fascia or extra-capsular suture or Patellar Sling

E) Corrective osteotomies of femur (Grade 4)

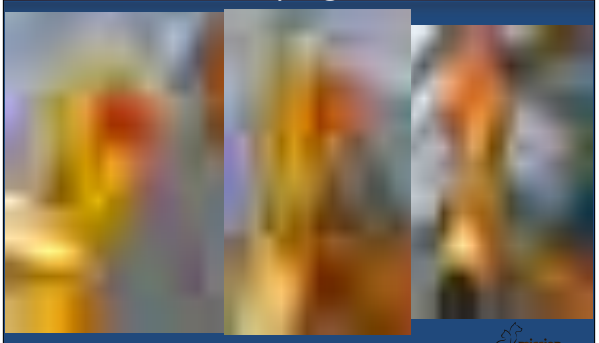
(Extra) Tools Needed



Positioning and Draping

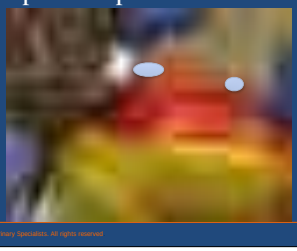


Draping In

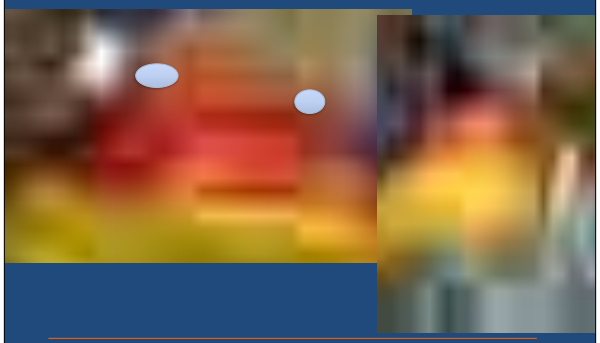


Soft Tissue Procedures

- Done on ALL patellar luxation cases!
- (Medial) Release
- (Lateral) Imbrication
- Goal: Help retain patella in trochlear groove



Soft Tissue Procedures



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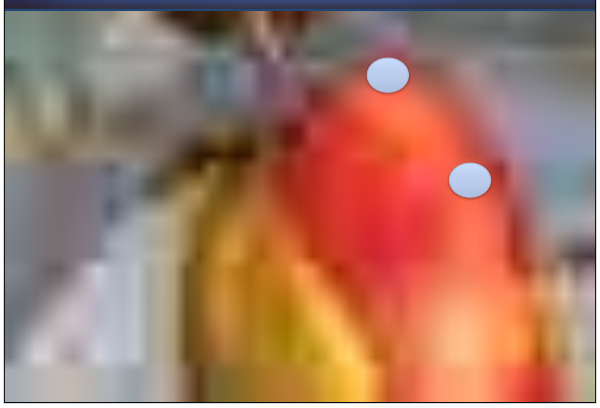
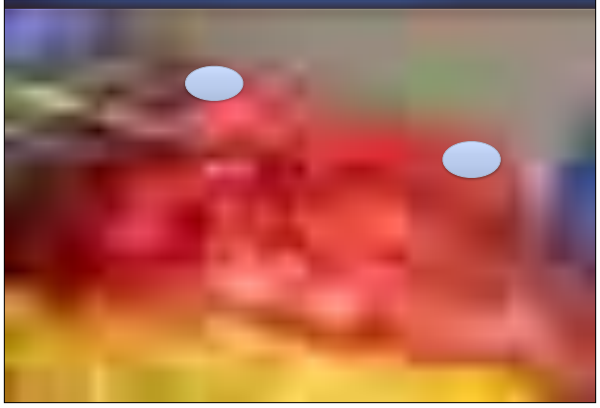
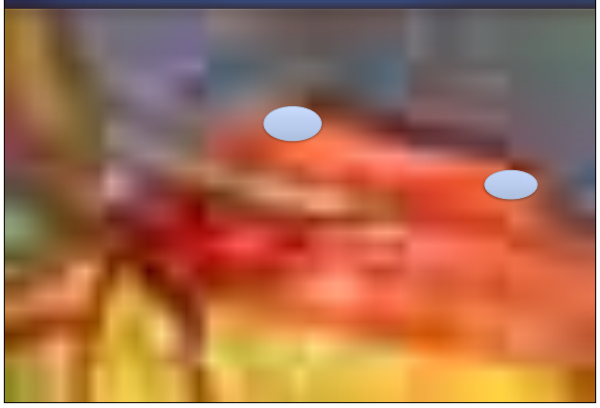


Soft Tissue Procedures

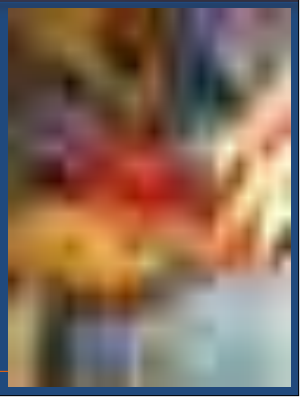


Soft Tissue Procedures

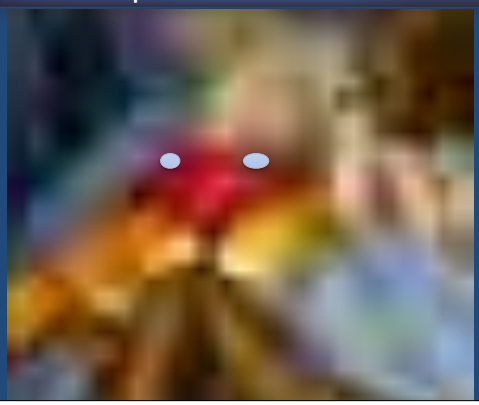


Medial Imbrication - Excess joint capsule

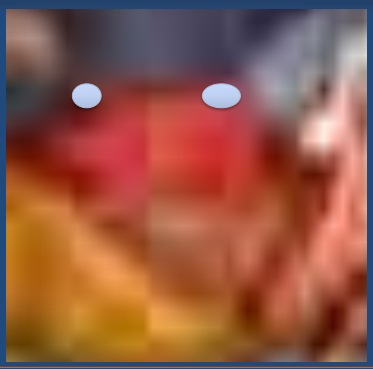
- Often very thick
- Remove small amounts - careful not to take too much!



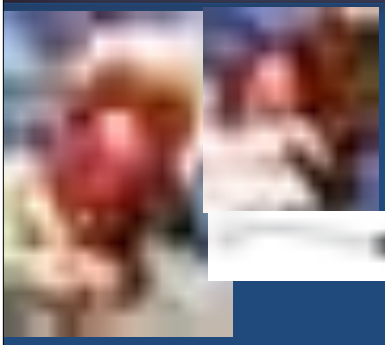
Capsular Imbrication



Capsular Imbrication



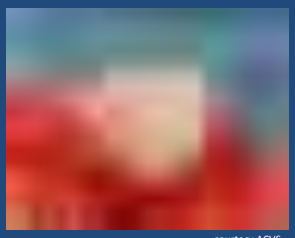
Examining Joint and Cruciates



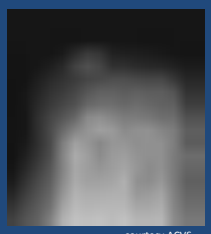
Up to 41% of dogs with MPL have CrCL tears; more likely with grade 4 MPL

Femoral Trochlear Groove

- Trochleoplasty almost always needed



courtesy ACVS



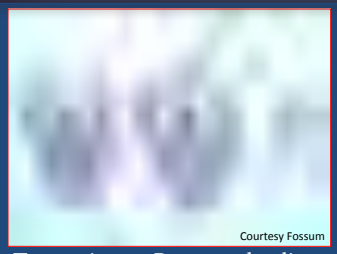
courtesy ACVS

Trochleoplasty

- 4 Trochleoplasty techniques
  - Chondroplasty (very young dogs only)
  - Abrasion (not recommended)
  - Wedge recession
  - Block recession
- Goal: Deepen the groove with minimal articular cartilage damage

Chondroplasty - Young dogs only

Abrasion Trochleoplasty

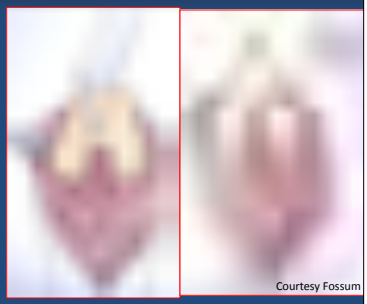


Courtesy Fossum

- Taumatic —> Removes hyaline cartilage
- Heals with fibrocartilage —> causes significant DJD
- Not recommended

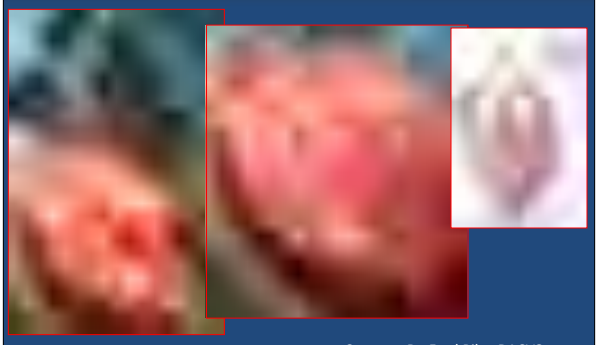
Wedge Recession Trochleoplasty

- Remove wedge of articular cartilage and subchondral bone
- Deepen trough
- Replace wedge —> Press fit
- Careful of Caudal Cruciate Ligament
- My preference in small dogs (<10kgs)



Courtesy Fossum

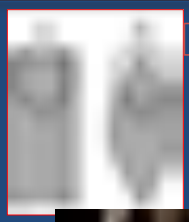
Wedge Recession

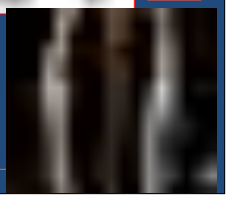


Courtesy Dr. Fred Pike, DACVS

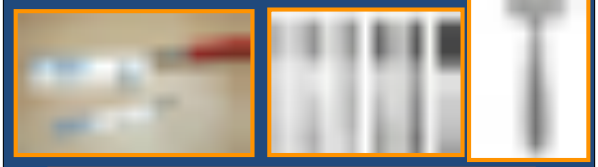
Block Vs. Wedge Trochleoplasty

- **BLOCK IS BETTER**
- Increases proximal patellar depth - Better at preventing luxation at extension
- Preserves a greater amount of trochlear cartilage

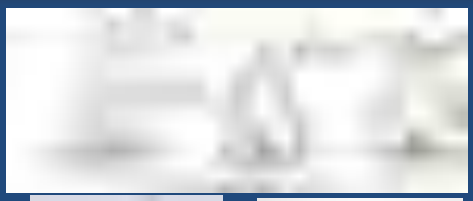


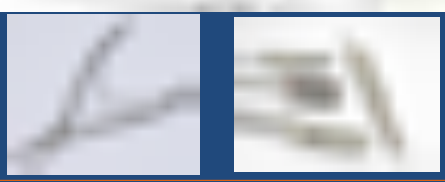


Block Recession Trochleoplasty

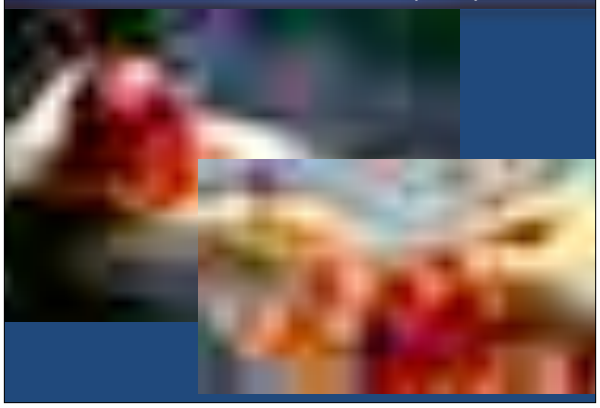


Block Recession Trochleoplasty

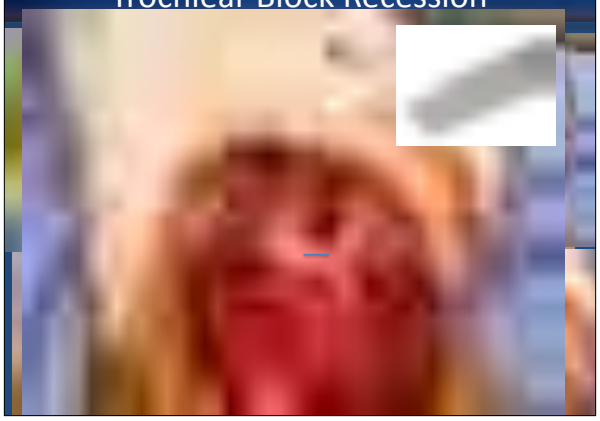




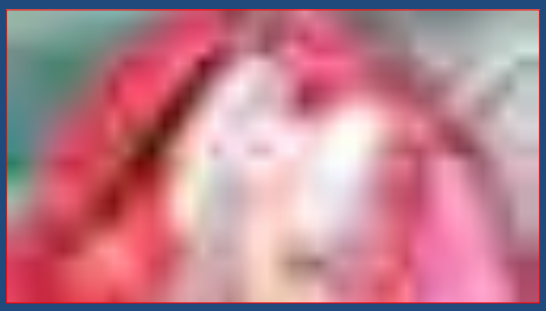
Block Recession Trochleoplasty



Trochlear Block Recession



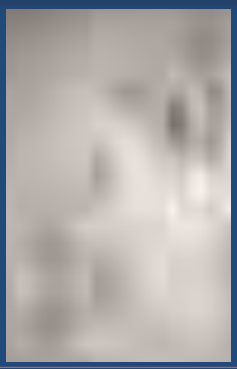
1 year post-op Trochlear Block Recession



Courtesy Dr. Fred Pike, DACVS

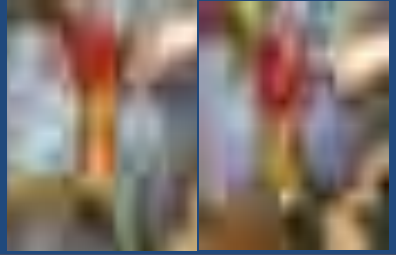
Tibial Tuberosity Transposition

- Goal is to align quadriceps mechanism
- Tuberosity laterally displaced (MPL)



When to do a TTT?

- After trochleoplasty is performed, reduce patella and put stifle through ROM - also evaluate the alignment of patella, tendon and distal limb



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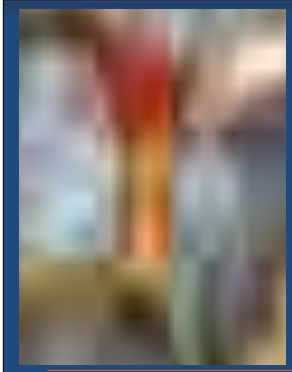
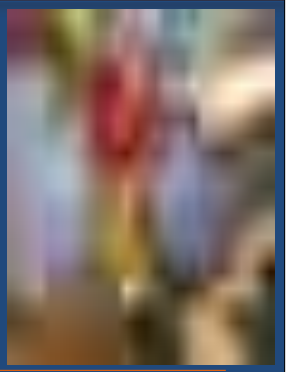
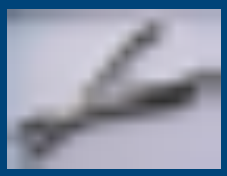




Tibial Tuberosity Transposition

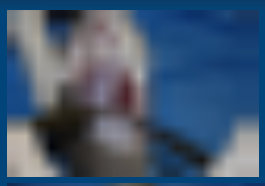
- Incomplete osteotomy is ideal but completion of bone cut is sometimes needed
- Osteotomy can be made with osteotome and mallet or bone cutters

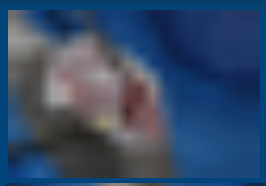


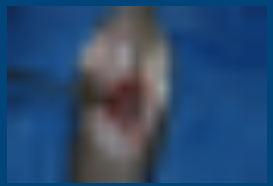
Tibial Tuberosity Transposition

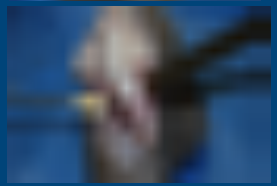
- Leave large enough segment to reattach with pin(s) and/or screw

TTT

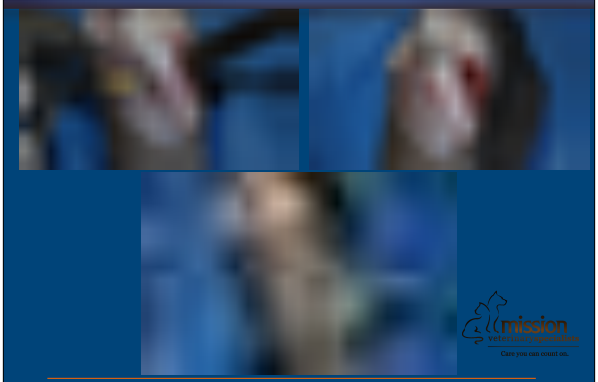






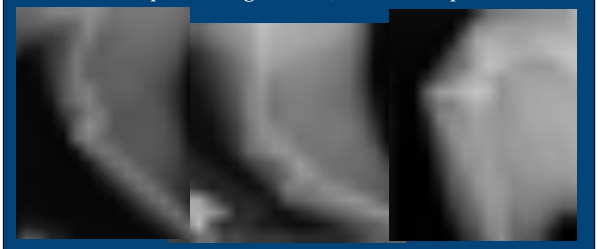


TTT

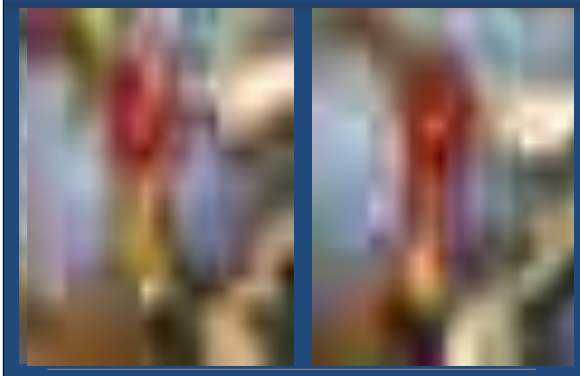


TTT

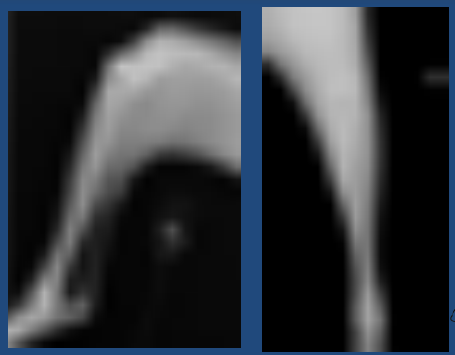
- Tension band - if fractured through cortex/ completed osteotomy or worried about excessive stress on patellar ligament (i.e. noncompliance)



When to do a TTT?



Tibial Tuberosity Transposition

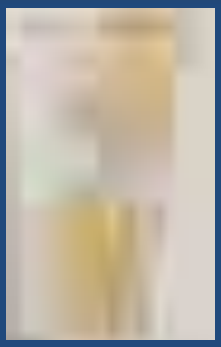


Anti-rotational Suture

- Sometimes TTT isn't enough or CrCL tear is present

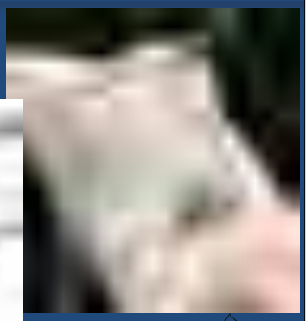
Lateral Reticular Reinforcement

- Around lateral labella to parapatellar fibrocartilage

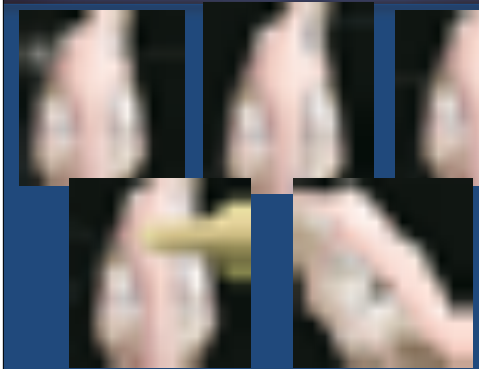


Patellar Sling

- Arthrex FasTak or
- Corkscrew; Fiberwire



Patellar Sling

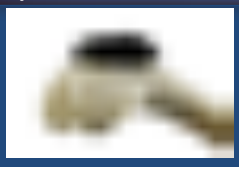


YouTube

MPL with Concurrent CrCL tear

Modified TPLO - *Langenbach et al JSAP 2010*

Kyon Patellar Groove Replacement



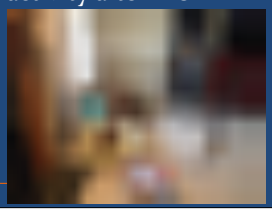
http://www.kyon.ch/current-products/patellar-groove-replacement-pgr

Post-operative Care

- NSAID +/- tramadol for 7-10 days
  - Methadone, hydromorphone IV post-op
- Glucosamine + chondroitin (Dasuquin)
- Fatty Acids - fish oil
- Bandage?

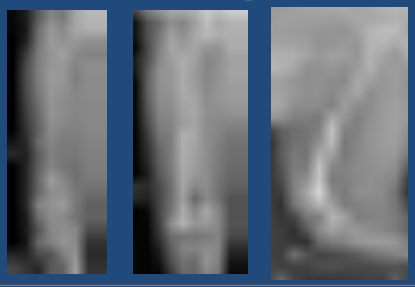
Post-operative Care

- 6-8 weeks of cage/pen confinement
  - 5-10 minute increments, focus on slow pace
  - Swimming, UW treadmill after skin heals
- Passive range of motion (PROM) exercises
- Gradual return to full activity after 6-8 weeks
- Pin removal?

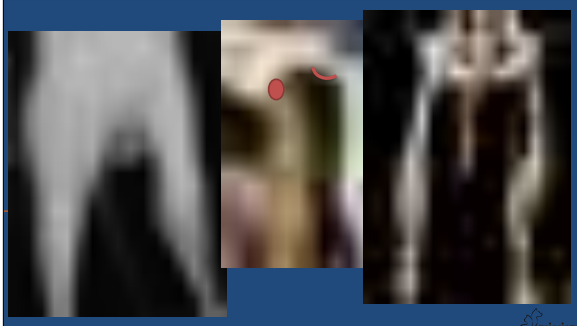


Grade 4 Luxation Repair

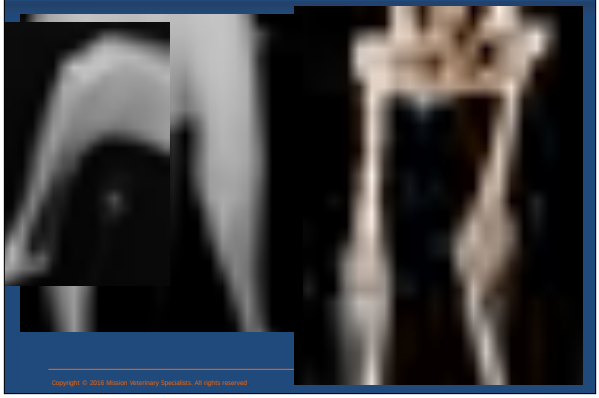
- More complicated
- Femoral varus often a component



Grade 4 Luxation Repair

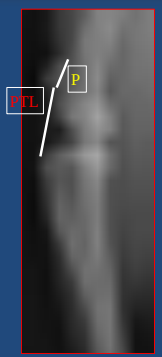


Grade 4 Luxation Repair

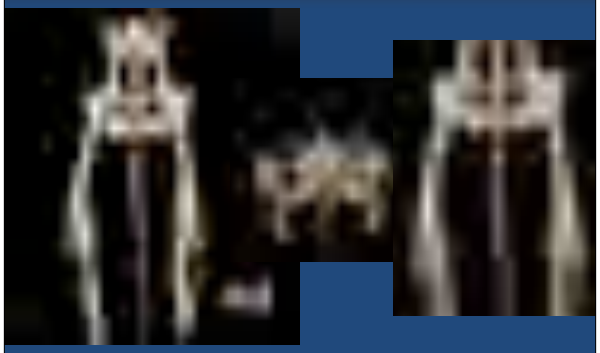


Patella Alta

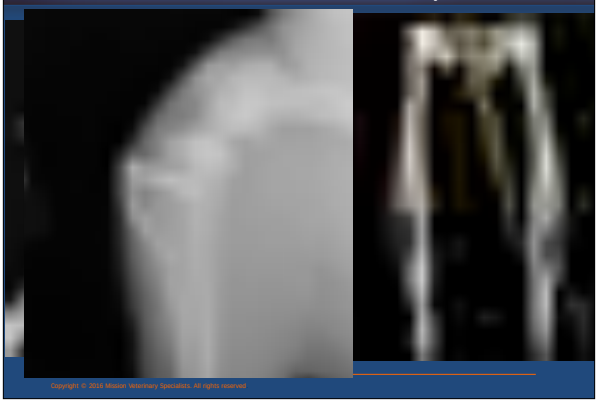
- Normal PTL:P ratio - 1.5 to 2.0
- Patella alta - too proximal
  - PTL:P ratio >2
- (Patella baja - PTL:P ratio <1.5)



Patella Alta



Patella Alta - Post-op



2 week Post-op

Outcome Data

- Grade 2-3 MPL have very good prognosis
  - Reluxation - 8% *(Vet Surg 2006)*
  - Major Complications - 18% (revision sx)
    - Reluxation
    - TTT fracture, lateral luxation, infection
- Grade 4 luxation has more guarded prognosis (60-80% success rate)

mission veterinary specialists
Care you can count on.

Methods to Improve Outcome

- Dogs with Trochleoplasty AND Tibial Tuberosity Transposition have lower risk of reluxation *(Vet Surg 2006)*
- Ensure imbrication of joint capsule and not just fascia
- Confinement and rehab/PROM

Questions?